

APPLICATION UNDER UNITED STATES PATENT LAWS

Invention: **TELEPHONE ANSWERING DEVICE WHICH NOTIFIES A USER
BASED ON CALL RELATED INFORMATION RECEIVED FROM
A CALLING PARTY**

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This is a:

- ☐ [] Provisional Application
- ☒ [X] Regular Utility Application
- ☐ [] Continuing Application
- ☐ [] PCT National Phase Application
- ☐ [] Design Application
- ☐ [] Reissue Application
- ☐ [] Plant Application

SPECIFICATION

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TELEPHONE ANSWERING DEVICE WHICH NOTIFIES A USER BASED ON CALL RELATED INFORMATION RECEIVED FROM A CALLING PARTY

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BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to voice messaging systems. More particularly, it relates to a telephone answering device capable of notifying a user at another telephone number based on call related
10 information received with respect to an incoming telephone call.

2. Background of Related Art

Voice messaging systems in general, and telephone answering devices (i.e., answering machines) in particular, are useful
15 devices for the home or office. A conventional telephone answering device operates on a single telephone line and answers an incoming call to an unused (i.e., on-hook) telephone after a desired number of rings. The telephone answering device causes the telephone line to enter an off-hook condition, then plays an outgoing greeting message to the calling
20 party. After the outgoing greeting message, the calling party may leave a voice message on the telephone answering device. At a later time, the voice message is replayed by the user, either local to the telephone answering device or via remote connection from another telephone.

Fig. 4 illustrates a conventional telephone answering device
25 capable of answering an incoming call on a telephone line.

In Fig. 4, a telephone answering device 11 is connected to a telephone company central office 13 via a telephone line 15. A telephone line interface (TLI) 17 in the telephone answering device 11 provides the conventional isolation, DC and AC impedance as required by telephone
30 company standards. The telephone line interface 17 also provides a ring detect signal to a controller 19. The controller 19 may be any suitable

processor, e.g., microprocessor, microcontroller, or digital signal processor (DSP). The ring detect signal indicates to the controller **19** the ringing of an incoming telephone call on the telephone line **15**.

5 After a desired number of ring signals, the telephone answering device **11** causes the telephone line interface **17** to place the telephone line in an off-hook state, and instructs a voice recorder/playback audio module **21** to play an outgoing greeting message **43** over the telephone line **15** to the calling party. Upon completion of the outgoing greeting message, the calling party may leave a voice message
10 in voice message memory **23** under the control of the controller **19**. A keypad **25** allows the user to select various modes of operation, including the playback of voice messages.

The conventional telephone answering device **11** illustrated in Fig. 4 further includes a call related information (e.g., Calling Identity
15 Delivery (Caller ID)) detector/receiver **27** to detect and receive call related information, e.g., the telephone number and/or household name of a calling party, from the central office over the telephone line **15**. The call related information is typically displayed on a display **29** and may be logged in a call related information log **39**.

20 By reviewing the call related information (e.g., Caller ID information) received with the ring signals of an incoming call, the user of the conventional telephone answering device **11** can determine the household name and/or telephone number of the calling party even before the calling party leaves a voice message. Basic call related information
25 such as Caller ID information is typically transmitted from the local telephone company to the telephone answering device **11** of the called party while the called party's telephone answering device **11** and other telephones are in a hung-up or on-hook state, e.g., between the first and second rings.

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✓ 5 Oftentimes, it is important or necessary for the user of a telephone answering device or other designated party to be immediately notified when a certain calling party leaves a voice message on the telephone answering system, when a certain number of telephone calls from a particular party have been received by the telephone answering device, or other predetermined event or events. However, with conventional telephone answering devices, the user must continually call in from a remote location to their telephone answering device to determine if any particular caller has called a number of times, etc. Moreover, 10 remote information from a telephone answering device typically includes only voice message information without an analysis of received call related information (i.e., some callers do not always leave a voice message). Unfortunately, conventional telephone answering device do not automatically notify a user or other party upon occurrence of a 15 predetermined event.

SUMMARY OF THE INVENTION

20 In accordance with the principles of the present invention, a controlling system for a voice messaging system is provided. The controlling system comprises a controller, a calling module, controlled by the controller, and adapted to initiate a telephone call, and a dual tone, multiple frequency (DTMF) generator. The calling module causes said controller to initiate an outgoing call using the DTMF generator upon receipt of predetermined call related information.

25 A method for notifying a user of a voice messaging system or other designated party upon receipt of a voice message from a calling party in accordance with the present invention comprises recording the voice message of the calling party, disconnecting the calling party from the voice messaging system, initiating a telephone call to the user or other

designated party, and playing the recorded voice message to the user or other designated party.

In accordance with another aspect of the present invention, a telephone answering device comprises a controller, a voice recorder/playback module, and a calling module activated by receipt of
5 predetermined call related information causing said controller to initiate a telephone call to a predetermined notification number and playing the recorded voice message.

10 **BRIEF DESCRIPTION OF THE DRAWINGS**

Features and advantages of the present invention will become apparent to those skilled in the art from the following description with reference to the drawings, in which:

Fig. 1 illustrates a telephone answering device capable of
15 notifying a user or other designated party upon analysis of call related information, in accordance with the principles of the present invention.

Fig. 2 illustrates an exemplary return call data directory table shown in Fig. 1.

Fig. 3 is a flow chart illustrating an exemplary process by
20 which the telephone answering device of Fig. 1 notifies a user or other designated party upon analysis of call related information, in accordance with the principles of the present invention.

Fig. 4 illustrates a conventional telephone answering device.

25 **DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS**

The present invention provides a technique for notifying a user at a remote location upon the occurrence of a predetermined event or sequence of events, e.g., when a particular party calls one or more times, based on an analysis of call related information received with
30 respect to incoming telephone calls. The analysis can preferably be

performed for all incoming telephone calls to the voice messaging system, whether or not the calling party left a voice message on the voice messaging system with any of their respective telephone calls.

Fig. 1 shows an exemplary voice messaging system which automatically notifies a user at a remote location upon the occurrence of a predetermined event in accordance with the principles of the present invention.

In particular, Fig. 1 illustrates a telephone answering device, indicated generally at 10, capable of recording voice messages from calling parties in an otherwise conventional fashion. The telephone answering device 10 includes a telephone line interface 12 for interconnection with a central office 14 via a telephone line 16. The telephone line interface 12 interconnects the telephone line 16 with a voice recorder/playback module 18. A controller 24 controls the overall operation of the telephone answering device 10, and includes a DTMF decoder 22 to allow remote control communications from a remote telephone. An alphanumeric keypad 32 and display 47 provide a user interface for making telephone calls, retrieving, recording and otherwise manipulating voice messages stored in voice message memory 30 and/or outgoing greeting message(s) stored in an outgoing greeting message storage location 43. The keypad 32 and display 47 also allow a user to program variable parameters within the telephone answering device 10, e.g., entries in a return call data directory 26 or for recording a customized notification message 45 as will be described in more detail herein below.

The telephone answering device 10 also includes a conventional call information detector/receiver 20 adapted to detect and receive call related information, e.g., Caller ID information such as a telephone number and/or household name of a calling party. Received call related information may be logged chronologically in a call related information log 39. The call related information detector/receiver 20

communicates with the telephone line 16 via the telephone line interface 12.

5 The telephone answering device 10 further includes an auto dialing calling module 28. The auto dialing calling module 28 is a procedure operating in the controller 24 which capable of initiating a telephone call to a desired party, and playing the notification message 45 upon answering of the automatically placed call. Preferably, after completion of the notification message 45, the controller 24 enters a monitoring mode wherein it accepts control signals from the remote telephone automatically dialed, e.g., using DTMF touch tones. Thus, after receiving playback of the notification message 45, the user can manipulate the voice messages stored in the voice message memory 30 as desired from the remote telephone.

15 In the disclosed embodiment, the auto dialing calling module 28 includes a DTMF tone generator 28a, which provides the DTMF touch tone digits of a telephone number designated by the user to be used for notification of a predetermined event.

20 Additionally, the telephone answering device 10 includes a return call data directory 26. The return call data directory 26 contains a database of entries each associating a predetermined event to particular call related information. For instance, in one embodiment, the return call data directory 26 includes a database associating specific Caller ID information, i.e., the name, the telephone number, etc., of a calling party, with a predetermined event, e.g., the number of times that a particular caller or group of callers may call (i.e., the number of call related information entries bearing a relevant time stamp and stored in the call related information log 39) before automatic notification is provided to the remote user. The return call data directory 26 is preferably stored in non-volatile memory such as Flash memory.

15 The telephone answering device 10 further includes a notification message 45, stored in non-volatile memory such as Flash memory, which is played to the user at a designated remote location 49 upon their answering a notification telephone call automatically dialed from the telephone answering device 10.

10 The designated remote location 49 in the disclosed embodiment is a non-volatile memory (e.g., Flash memory) location storing the digits of a telephone number to be dialed to locate the remote user. The user may change the telephone number stored in the remote notification designation 49 as desired, either using the keypad 32 upon prompting by the controller 24 using the display 47, or using an alphanumeric keypad of a remote telephone upon establishment of a telephone call with the telephone answering device 10.

15 The telephone answering device 10 of the present invention further includes a controller 24, which may be any suitable processor, e.g., microprocessor, microcontroller, or digital signal processor (DSP).

The controller 24 may include a DTMF decoder 22 to allow remote control of the telephone answering device 10 from a remote telephone over an established telephone connection.

20 The DTMF decoder 22, calling module 28, and/or return call data directory 26 can be integrated within program code of the controller 24, and/or external or separate from the controller 24 but nevertheless in communication with the controller 24.

25 In the disclosed embodiment, the user is notified over the public switched telephone network (PSTN) using the auto dialing calling module 28 based on the occurrence of one or more predetermined events defined by the user in an entry in the return call data directory 26. Although the disclosed auto dialing calling module 28 is capable of automatically dialing a telephone number and of allowing the subsequent establishment of a telephone call with the called telephone equipment, it is

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within the principles of the present invention to include additional protocols in the auto dialing calling module 28 as necessary to allow communication over more sophisticated mediums, e.g., over the Internet, over a paging system, using e-mail, etc. For instance, the auto dialing calling module 28
5 may include the necessary protocols (e.g., TCP/IP) to send a digitized form of the notification message to the user at the designated remote location 49 using the Internet.

In accordance with the principles of the present invention, the telephone answering device notifies the user or other designated party
10 at a predetermined remote location 49, e.g., using a telephone number (or web site or e-mail address), and plays (or provides in textual form) a pre-recorded notification message 45 notifying the user that a predetermined event at their telephone answering device has occurred. After listening to the notification message 45, the user would then take over remote control
15 of their voice messaging system (e.g., their telephone answering device) and retrieve their voice messages.

The pre-recorded notification message provided to the user may include synthesized information relating to the specific event which has occurred, or textual information either directly by the user through the
20 keypad 32 or using a conventional voice-to-text converter implemented in the controller 24.

For instance, a general, pre-recorded notification message may be pre-recorded by the user, stored as the notification message 45, and later played. An example message is: "This is an automatic
25 notification requested from your voice messaging system."

A text-to-voice type voice synthesis may additionally or alternatively be provided by the telephone answering device 10 to the remote user with a synthesized audible message such as: "Event number five has been satisfied." Alternatively, or additionally, the user may query
30 the voice messaging system (e.g., telephone answering device 10) to

determine the particular call related information (e.g., telephone number and/or household name) which has caused the event to be satisfied.

Using the automatic notification of a specific event in accordance with the principles of the present invention, the user will benefit from the typically lower toll rates with a call made from their home or office to the remote location (rather than from the remote location to their home or office). Moreover, the user can save time by not having to continually call their voice messaging system to retrieve any voice messages which might have been left.

The remote notification designation **49** can be programmed by the user either when local to the telephone answering device **10** or through remote communications therewith. Similarly, entries in the return call data directory **26** can be added, deleted, or modified by the user through remote or local programming.

The notification can result from the addition of call related information relating to a particular caller or callers into the call related information log **39**, or on a total number of entries in the call related information log **39**, a number of entries added over a predetermined period of time, etc., all based on received call related information stored in the call related information log **39**.

In accordance with the principles of the present invention, the user will be notified regarding calls to their voice messaging system whether or not the calling party left a voice message. Thus, the remote user can be notified regarding information which is not available from a conventional retrieval of voice messages from a voice messaging system.

The auto dialing calling module **28** notifies the user or other party designated in the remote notification designation **49** after a triggering entry is added to the call related information log **39**. Preferably the controller **24** analyzes the contents of the call related information log **39** during a quite period after each new entry therein, and activates the

auto dialing calling module 28 upon satisfaction of any specific criteria defined in the return call data directory 26. Upon disconnection of the calling party subsequent to leaving a voice message, the auto dialing calling module 28 of the telephone answering device 10 allows a dial tone from the central office 14 to be presented to the telephone answering device 10. The telephone answering device 10 then dials out to the pre-stored predetermined telephone number using the DTMF generator 28a, waits for the called party to answer, and then provides the notification message 45, e.g., by audibly playing a pre-recorded notification message to the user or other designated party presumed to have answered the telephone call.

The calling module 28 is preferably a software module included within the program code of the controller 24. Of course, the calling module 28 can be implemented separate from the controller 24, but regardless, will preferably be in communication with the controller 24.

Entries in the return call data directory 26 can be pre-stored by the user of the telephone answering device 10. In particular, to pre-store entries in the return call data directory 26, the telephone consumer can be prompted by an appropriate application program running in the controller 24 to associate particular Caller ID information, e.g., a telephone number, name, etc., to a particular call back telephone number.

The database of the return call data directory 26 can alternatively be downloaded from the telephone company central office 14, e.g., upon installation of the telephone answering device 10 and/or when instructed by the telephone consumer. In this case, a modem may be included in the telephone answering device 10 to receive data from another modem at the telephone company central office 14. Ideally, a special telephone number would be dialed at the telephone answering device 10 to establish a connection to a modem at the telephone

company central office **14** associated with that special notification telephone number.

Alternatively, the return call data directory **26** and/or the calling module **28** can be maintained at the telephone company central office **14**. In this case, the telephone company central office **14** would determine the Caller ID information and initiate a call back of the user or other designated party. The return call data directory **26** can be updated on a more frequent periodic or occasional basis if it is installed at the telephone company central office **14**.

Furthermore, the telephone consumer can modify the entries in the return call data directory **26** by simply calling a designated telephone number at the telephone company central office **14** and adding or deleting entries via instruction to the controller **24** through the keypad **32** of the telephone answering device **10**.

Deactivation of the auto dialing calling module **24** may be allowed by inclusion of a dedicated button on the telephone answering device **10**.

Fig. 2 illustrates an exemplary list of entries **202-212** and **218** in the database of the return call data directory **26** after programming by the telephone consumer.

In particular, each of the entries in the exemplary embodiment associate particular call related information (e.g., a telephone number) to a particular event, and a separate telephone number to be notified (or the default stored in the remote notification designation **49**) in the event that the event becomes satisfied. In the exemplary embodiment, the event is the number of times that the particular call related information **220** is matched in the call related information log **39**.

For instance, in the first entry **202**, after one call is received from 888-555-1212, the notification message **45** is sent to 888-555-1414

under the control of the auto dialing calling module **28** when the telephone answering device **10** is otherwise not in use.

A second entry **204** and the sixth entry **212** are in a deactivated state wherein no notification is provided. The second entry
5 **204** and sixth entry **212** remain in the return call data directory **26** to provide ease for reestablishment of the entry at a time in the future.

The third entry **206** provides notification to 888-555-1515 after 'Smith' calls twice. The fourth and fifth entries **208-210** provide notification to the default remote notification designation **49** upon a single
10 entry in the call related information log **39**.

The last entry **218** is a default condition defining an event wherein notification is provided to 888-555-1234 after ten entries from any calling party all within one hour are entered in the call related information log **39**.

Other parameters may be included with each entry **202-218**.
15 For instance, an urgency may be designated for notification within, e.g., 10 minutes, 20 minutes, etc., and appropriate action taken by the controller **24** and/or auto dialing calling module **28**.

Fig. 3 illustrates an exemplary flow chart showing the process by which the telephone answering device **10** of Fig. 1 notifies the user or other designated party at a designated, predetermined telephone number upon the occurrence of a qualifying event.
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In particular, with reference to Fig. 3, in step **302**, the calling party calls the user's assigned telephone number of the telephone line **16**.
25 Whether or not a voice message is left, an appropriate entry is logged in the call related information log **39** as shown in step **304**.

In decision step **306**, the controller **24** determines whether or not a qualifying event indicated by the entries in the return call data directory **26** has occurred. If no qualifying event has occurred, the
30 process ends. However, if a notification qualifying event is determined by

the controller **24**, e.g., if the designated number of matches are found in a predetermined number of entries in the call related information log **39** over the designated period, the controller **24** activates the auto dialing calling module **28** to initiate a notification of the user at the designated telephone number (i.e., as designated in the matched event entry in the return call data directory **26** or as indicated in the remote notification designation **49**.

In step **308**, the telephone answering device **10** notifies the user or other designated party by dialing the notification telephone number.

In step **310**, upon answering of the notification telephone call to the user at the designated remote location, the telephone answering device **10** plays or otherwise provides the notification message **45**.

Although the described embodiments relate to the implementation of an auto dialing calling module, return call data directory and notification message in a voice messaging system such as a telephone answering device, the principles of the present invention relate equally to the implementation of an auto dialing calling module, return call data directory and/or notification message implemented at the telephone company central office **14**.

While the invention has been described with reference to the exemplary embodiments thereof, those skilled in the art will be able to make various modifications to the described embodiments of the invention without departing from the true spirit and scope of the invention.